ORIGINS
• Journal of the Biblical Creation Society •

Volume 4 Number 10

In this issue:

Rocks and Scripture 3

Seeing and Believing

A Challenge to Theistic Evolutionists

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Contents

		Page
Editorial	Nancy Darrall	**1**
Creation in the News		**2**
Rocks and Scripture: On the Right Track?	Michael Garton	**3**
Seeing and Believing – The Amazing Process of Human Vision	Sylvia Baker	**9**
A Challenge to Theistic Evolutionists	Arthur Jones	**12**
Reviews:		
The Discovery of Noah's Ark	John Peet	**14**
Wonderfully Made	David Watts	**14**
Curriculum Unmasked	Peter Butterfield	**15**
Correspondence		**16**
News of Creation		**20**

Writing for Origins

Origins is looking for talented new writers, particularly those who have had experience in a specialised field of science or theology, in relation to creation, and who are in agreement with the aims and basis of the BCS. In addition writers in a popular vein are needed, but accuracy and solid content are still essential. Any manuscripts for consideration should ideally be typed, double-spaced and sent to the Editor. News items that may be of interest are also sought. We now welcome articles on disk in most formats, but 5¼″ DD, Wordperfect 4.2 is preferred; media will be returned after transfer of the file.

Editorial Policy

Whilst **Origins** exists to further the aims of the Biblical Creation Society, opinions expressed in articles and signed editorials are not necessarily shared by either the Editorial Committee or the Society.

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Editorial

WITH the arrival of Volume 4 of *Origins*, a number of changes have taken place. Mike Matthews has resigned as editor due to the pressure of other commitments. We would like to thank Mike for all that he has done in planning, editing and writing for *Origins* in past issues and it is perhaps a fitting testimonial that three of us are now taking over what Mike did alone. We look forward to his continued contribution to the journal as an author and to the Biblical Creation Society as a whole through his work on the committee.

In response to the last few issues we have received a number of critical letters regarding the articles that we have published on the age of the earth. Whilst it is our aim as far as possible to 'instruct rather than to dispute' as one correspondent requests of our journal, there are a variety of views on the age of the earth within creationism. It is worth noting that much yet remains to be done to work out a full understanding of geological findings within a Biblical framework and we are thankful to those who are able to contribute to Biblical Creationism in this field.

Authors who submit articles for *Origins* are expected to adhere to the BCS Basis of Faith to be found on the membership leaflet. The 'Creation Manifesto,' published in issue 2:5 of *Origins* defines the 'bottom line' for a Biblical Creationist. Within these constraints, an author is permitted to express his or her own opinions (without personal attacks on others, of course) as a basis for further research and discussion. As many journals say, 'The views expressed do not necessarily represent those of the editors' and *Origins* is no exception. Obviously readers will disagree with some of the views expressed. If you do (or if you wish to support the author's view), why not write us a letter? Keep it succinct and within the BCS guidelines indicated above and we will hope to publish a selection of such letters in future issues of the journal.

In this issue of *Origins*, we have a range of articles. Michael Garton continues his series 'Rocks and Scripture,' Arthur Jones discusses several books on theistic evolution and Sylvia Baker commences a series on design.

In the current article, Michael Garton looks at the interesting topic of animal trackways preserved in rocks. Such trackways were, of course, made by living animals. The author concludes that they were most likely to have been formed after the flood as they are found late in the sequence of sedimentary rocks (the last and highest rock layers). At this time, there would have been a great deal of biological and geological re-adjustment occurring, when population explosions in certain groups of animals and plants and local or not-so-local disasters were taking place. Examples would be the algal blooms that precipitated the white cliffs of Dover, the Ice Age and the flourishing and subsequent extinction of the dinosaurs.

In this volume, we are starting a series on design, with the first of a number of articles by Sylvia Baker on the eye. This article deals with the various structures that go to make up the visual system of the eye and the reader is clearly challenged to understand that such complexity shows evidence for design rather than a chance origin. We hope that this series will provide our readers with helpful information from which they can persuade others for the evidence for design and therefore a Designer.

A challenge to Theistic Evolutionists is presented in the form of a survey of recent books by Dr Arthur Jones. He highlights the apparent ignorance of a wealth of technical creationist literature on the part of the authors by its absence from the references cited in these books. Further, Dr Jones brings out the disturbing way in which a non-literal interpretation of Genesis is encouraged or defended in the two books by Johnson and by Poole and Wenham respectively. In these, they call for changes in Biblical interpretation because of supposed contradiction between science and the traditional literal interpretation. The second two books considered are historical studies on the Creation/Evolution debate in which the assumption that the interpretation of scientific information is much more certain than that of Scripture is clearly evident. Dr Jones challenges those who think in this way to spell out their own position and to work out the implications of Theistic Evolution for scientific research. Just how do they conceive that God would create by evolution? As Biblical Creationists, a major part of our discussion is likely to be with those who call themselves Theistic Evolutionists. We need to have thought carefully about their position and this article, along with the books that it highlights, presents us with this challenge. It is hoped that further articles on this theme will follow.

During the period of change-over in editorship there have been more than the normal number of 'weighty' articles in some issues. We would like to apologise for this and assure you that in future issues we hope to redress the balance. We hope that you look on the journal not only as a way of updating yourself on these issues, but also as a useful source of information which can be drawn upon when others ask questions outside your own particular field. Our plans for future issues are to include regular theological articles by looking at sections of the Creation Manifesto. Many of the topics here are of far reaching importance to the Christian in many ways, but we hope to focus particularly on those aspects relating to the Creation/Evolution debate.

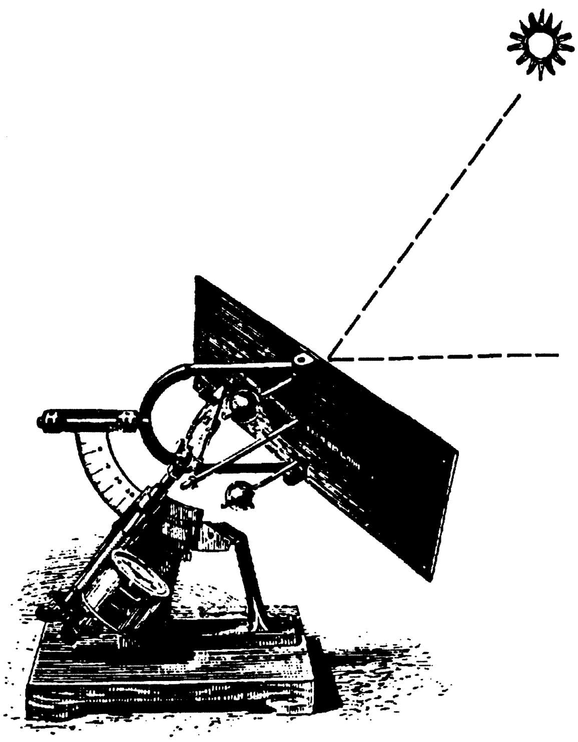
Creation in the News

Brighton Big Bang Brainstorming

New Scientist, 5th January 1991, p. 21

THE popular Sussex coastal resort was host to a symposium on 'Relativistic Astrophysics, Cosmology and Fundamental Physics' during December. At least one participant dared to question the version of the Big Bang that has been fashionable for the last ten years.

A question that arose soon after the Big Bang Theory was first put forward was whether gravitational attraction could slow down its expansion, bring it to a halt, and pull it back, collapsing into a Big Crunch. If there were not enough matter, it would expand forever. This brought forth the idea of an eternal cycle of expansion and contraction, 'the oscillating universe.' Using the assumption that the 'red-shift' on the spectrum of an astronomical object gives a measure of its speed, the best estimates indicated that the universe was right on the borderline between carrying on expanding, and collapsing back.



A theory which explains this tremendous coincidence is known as the 'inflationary model.' Unfortunately this requires more material in the universe than we can see, and so the extra mass is said to be made up of special stuff called 'dark matter.' Scientists are used to temporarily employing 'fudge-factors' in their calculations to tidy up small discrepancies, but a number of cosmologists are unhappy that the universe would have to be made of 90% dark matter, 10% visible matter, for the theory to cope. Basically the material is undetectable except for the gravitational effects that make the inflationary model work. One use it does have though, is in explaining why rotating spiral galaxies have not wound up, like a coil spring, during the course of their supposed great age. If one supposes that there is dark matter above and below the plane of the galaxy, it rotates rather more as a solid object, without tightening the spiral. In all only some 20% of the dark matter can be accounted for by such effects. A simpler solution, is that the universe is not very old, but this has disturbing consequences to any model of evolution, and is therefore not intellectually respectable.

An American astrophysicist called Craig Hogan from Washington, tried to revitalise interest in models of the Big Bang that include inhomogeneities or 'lumps' from very early in the life of the universe. This is more in keeping with some recent observations of vast, crumpled sheets of galaxies, at the limits of visibility. (See 'One Lump or Two' *Origins* 3:8, p. 17). At such distances they are supposedly very old, and when extrapolated back to their origins, they cause problems for smooth homogenous models. These models produce enough normal matter to explain away the 20% of dark matter that was supposedly detectable.

Only time will tell how the fashion in cosmology will change. Lurking in the wings is Swedish Nobel laureate Hannes Alven, who has an alternative to the Big Bang, wherein electromagnetism dominates rather than gravity. There will always be more than one explanation for a phenomenon that cannot be repeated, and where intelligent design is indicated, the final word should always rest with the Manufacturer's Handbook.

Rocks and Scripture: On the Right Track?

Michael Garton

Summary – Footprints as a key to link rocks and Scripture

DISBELIEF in Genesis, the first book of the Bible, has lead millions to conclude that man is not spiritually dead. The role of Christ as the only mediator becomes unnecessary or incomprehensible. Hence it is important that Christians have an understanding of origins which fits in with a reasonable interpretation of Genesis: we must bring rocks and Scripture together.

A major focus of these early chapters of Genesis is The Flood. Since The Flood must have had geological significance, it should provide a link between historical science and Biblical history. A special feature about The Flood is that when it started, everything was alive. 40 days later, everything that had lived on the land was dead. We can apply this fact to geology, because many rock layers preserve ancient tracks where some animal has walked in the distant past.

However, only live animals can walk! Hence tracks and footprints preserve evidence of live animals. If any particular layers of rock contain tracks of air-breathing creatures (now fossilised into stone) and someone suggests they formed during The Flood, we know that, if they really are Flood layers, they must be from the beginning of The Flood (*i.e.* before the creature drowned). Otherwise the track bearing layer does not date from The Flood at all.

The continents are made up of layers of rock, the oldest layers buried under later layers. On every continent, fossil tracks occur only in the latest layers. If it be assumed that The Flood deposited most of these layers, the tracks are in the wrong place, too late in the sequence. We find tracks just when we would expect all evidence for life was extinguished. This suggests that the track bearing layers are all from after The Flood.

Further, Scripture leads me to contend that the Lord did not just kill, He destroyed every air-breathing creature at the very beginning of The Flood. Yet every fossil we have of air-breathing creatures was excavated from later layers – the ones which contain tracks. This leads to a surprising conclusion: such fossils must all be from after The Flood. All dinosaurs, mammoths and other air-breathing creatures (now fossils in our museums) were born after The Flood; they are not fossils from The Flood.

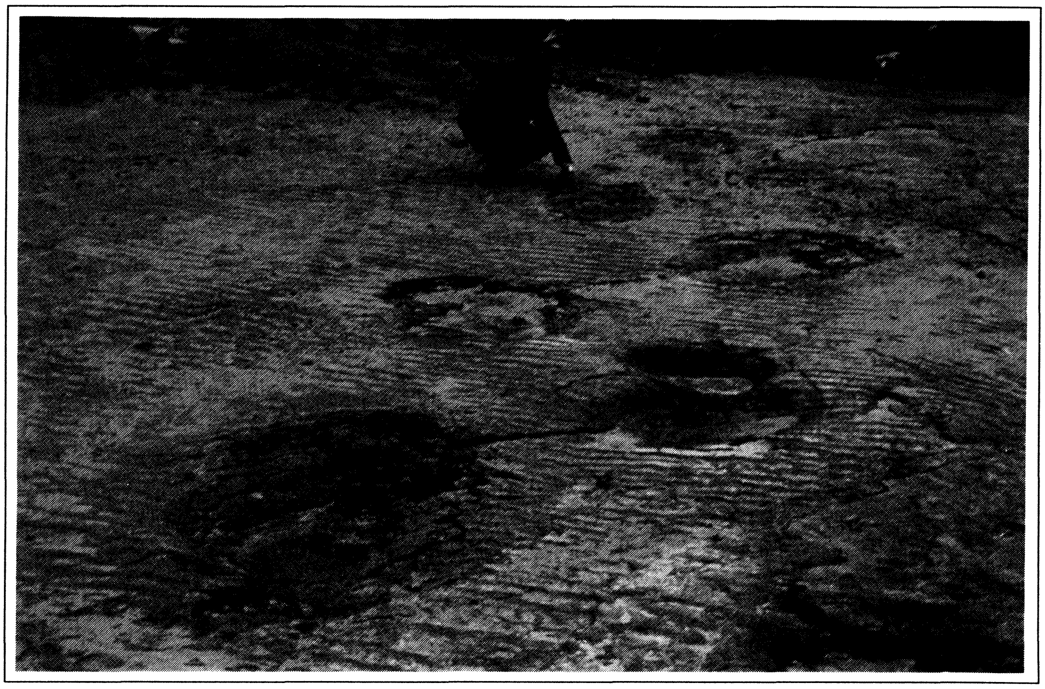


Fig 1. *Dinosaur footprints from Northern Germany (Courtesy of Joachim Scheven)*

Undermining of Western Civilisation

The secularisation of western society has been one effect of accepting the hypothesis of evolution popularised by Charles Darwin. That, at least, is the view of one scientist, (Denton, 1987 p17) whom I understand does not profess to be a Christian. I also believe Darwin's conclusions have undermined western civilisation. The evolutionary view of origins, so widely accepted today, holds sway because almost all scientists would think it laughable that there are statements in Scripture which may necessitate re-evaluation of their scientific conclusions.

In the first article in this series I drew attention to the danger of divorcing science from Christian theology, stating that it must be erroneous to suggest that there is any human endeavour that is not subject to correction from the Bible. This is not to shackle science. Rather, it is the instruction of a loving God who offers to guide us. The alternative is to make wrong or unwarranted assumptions about things we cannot prove. Such assumptions have encouraged millions of us to believe that Genesis Chapter 3 is not real history. We have therefore been encouraged to believe that we are not spiritually dead, without God and without hope, and hence have no need of the only mediator between man and God – Jesus Christ.

If acceptance of evolutionary theory has encouraged rejection of God, then it is too serious (and tragic) an issue for Christians to neglect. What correction can theology bring to science?

History – Recorded in Rocks and Scripture

The Bible states that a number of events happened between Creation and the birth of Abraham. Starting with the latest at the top, they include:–

Birth of Abraham ↑
Babel Incident
The Flood TIME
Adam's Disobedience
Creation

This is the order Scripture gives. Geologists also claim to know the history of the earth from its beginning until recent times. Since both Scripture and geology begin at the beginning, they must overlap: both geology and the Bible must claim to give a description of the same period of time. In the last article I suggested there was, broadly speaking, an order to geological events. We could list a sequence of significant events (or at least layers of rock reflecting those events). As a point of reference, I will also include the birth of Abraham. Again I will put the latest event at the top of the list:–

(Birth of Abraham) ↑
'Ice Age'
Deposition of Chalk
'Age of Dinosaurs'
Worldwide Coal TIME
Rocks only containing fossils of aquatic
(*i.e.* non-air-breathing animals)
Origin of Earth and most Ancient Rocks

Even the most sceptical reader must concede that the Bible is some sort of book of history. We have seen that both these chronological lists start and finish at the same time. If theology and historical science are to interact, then we have to face the question, 'How do they fit together?' A once popular solution (the 'gap theory') was to duck the issue, hang all the events of the second list together as 'geology' and say it all happened at the very beginning, within the first verse of the first chapter of the Bible, Genesis 1:1.

Supposed Theological History	*Scientific History*	
Birth of Abraham	Birth of Abraham	↑
Babel Genesis 11		
The Flood Genesis 6:8	?	TIME
Adam's Disobedience Genesis 3		
(Supposed 'Gap' in Genesis 1:1)	(All 'Geology')	
Creation	Creation	

This attempt at harmony faces the obvious problem – where is the evidence for The Flood? To embrace the 'Gap Theory' is to say that The Flood has left no record. Some evangelical Christians attempted to explain this last century by the 'Tranquil Flood Theory' – that it was such a quiet event, the waters went up and down so quietly they left no evidence. However, geologists were rightly confident, even last century, to conclude that even a tranquil Flood would have left some evidence. Geology concludes there was no *tranquil* Flood, and as I claimed in the first article, so does Scripture! In his commentary on *The Flood Scriptures*, Leupold (1942 p. 301) notes just how mighty the waters of The Flood were, with capacity to work great changes. He asked 'When will geologists begin to notice these basic facts?' Let me state clearly, any Christian who embraces the conventional evolutionary history of the earth or the 'Gap Theory' must necessarily deny that The Flood was a universal judgement.

I plead for caution in accepting any suggestion that The Flood was not universal. It has always been a Satanic ploy to try to maintain that, outside Christ, man is not spiritually dead, or that God's judgement is partial, or not really that severe. In Peter's second letter, he brackets that judgement by water with the coming judgement by fire. To say that the one is not complete and universal is to suggest that the coming judgement is partial – the slippery road which ends up denying that all must be born again to be saved.

How then can we bring historical science and theology together? I believe The Flood must have left its mark on geology, so we will start there, on the first day of The Flood.

Putting together a Model – Where do Footprints fit in?

In the first article I emphasised that The Flood began suddenly. Initially, some men and air-breathing creatures may have been able to flee for their lives. They could have left tracks and footprints, which would have been made in extremely heavy rain. I think it unlikely that such tracks would be found, both because life was quickly swept away, and because conditions for footprint preservation were not good.

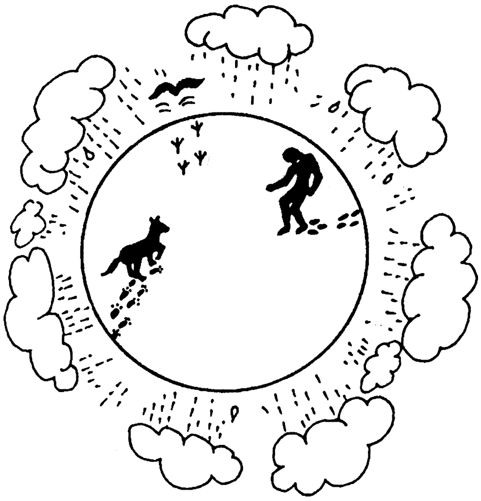


Fig 2: *The Earth during The Flood – Day 1. Animals, birds and man alive, but about to perish. Footprints possible.*

However, up to day 40 of The Flood, tracks – evidence of life – are potentially possible. Thereafter all air-breathing creatures were dead (see first article).

Hence tracks of air-breathing creatures should not be found in any rock layer deposited between the 41st day and the end of The Flood, a year later. However, Scripture does not say that aquatic creatures were all killed in The Flood – they could leave tracks throughout The Flood. Also, at first sight you may suggest that bones and skeletons of the dead people and dead air breathers might be found after the first 40 days. We will reconsider this below.

After the Flood ended the people and creatures came out of the Ark and were to be 'fruitful and multiply and replenish the earth.' This is a blessing which God commanded for that particular time, and means that there must have been a rapid, even miraculous by our standards, propagation of the air breathers which came out of the ark, immediately after The Flood. If geological activity continued, and more rock layers accummulated, how would those layers differ from Flood layers? An essential difference would be that the upper rock layers (*i.e.* those deposited after The Flood) may also contain tracks throughout (as well as skeletons) of air-breathing creatures. However, such post-Flood fossils would not necessarily be associated with evidence for rain.

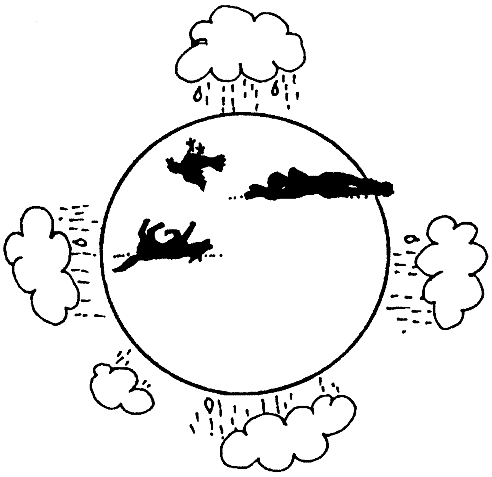


Fig 3: *The Earth during The Flood – Day 41 until the end. All animals, birds and men outside the ark are dead. Scripture does not just say they died. They were blotted out. The footprints of air breathers are not possible.*

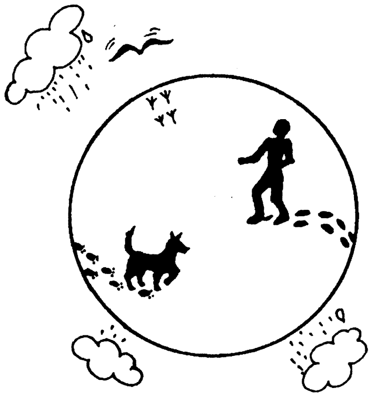


Fig 4: *The Earth after The Flood. Animals, birds and man multiply and replenish the Earth. Tracks possible again.*

In our model then, we would expect there to be layers of rock all round the globe resulting from The Flood. We can only guess what thickness they might be. However, since dam bursts, storms and flash floods are capable of depositing hundreds of feet of sediment in hours, we should not be too surprised if a global, divine judgement might have covered the earth with layers of sediment miles thick. In that pile of sediment, only the very lowest part (deposited at the beginning of The Flood) can record evidence of tracks and footprints of air breathers.

Thus far we have only considered The Flood and its aftermath. Before The Flood there are 1656 years back to the beginning of creation. [*Editorial note:* This value is based on the Masoretic text genealogies.] Christians involved in creation studies have been content to conclude they would not expect there to be much if any fossilisation between creation and The Flood. This seems a reasonable inference.

In this model, I have not shown any bones or skeletons of the air breathers killed during The Flood. Should we find them? I think not, for two reasons.

1. God not only said they died (Gen.7:21,22) but that He would and did destroy them (Gen.6:7; 7:4, 23). This is the same word as David used in Psalm 51, when he asked the Lord to blot out his transgression (Ps. 51:1,9) such that they might be no more. The air breathers were blotted out.
2. By faith we believe the Bible. God has never allowed our faith to be dependant on, say, having the Cross upon which He was crucified in a museum. By the same token we must receive His record of His action as He chooses. We might like a cliff containing the skeletons of those who perished, (what idols we would make of them) but God does not work to please us – we, by faith, must believe His record and the evidence, but He didn't work quite as pleases our intellect. This is not to say the evidence for The Flood is not there, however, as it certainly is (miles thick in many places!). The Lord has given us the Bible to save us making assumptions about things we cannot prove, and so interpret this evidence erroneously.

Worldwide, Where are the Tracks?

If we summarise the fossils and tracks found world wide, we can then attempt to see if, on the evidence we have been considering, the known sequences of layers could somewhere accommodate the model sequence we have predicted from the Genesis account. If our model can be harmonised with geological facts we will have made a major step forward in our aim of bringing theology and science together.

If we had adopted a popular view, we would have immediately hit a problem. Many creationists have talked about men and creatures fleeing the rising Flood waters, and man, the cleverest of all, the last to be out-witted by the waters. Tracks of air breathers are only found in the very last layers to be deposited and the tracks of man only in the very uppermost of these. Underneath such tracks can be rock layers miles thick which contain only fossils of non-air-breathing creatures, and no tracks. From the violence and speed with which they were evidently deposited, they are obvious candidates for 'Flood Layers.' The tracks on top of them would then have to be from people who survived up until day 40 of The Flood. On this model, almost all the geological layers since creation would have to have been deposited in just 40 days, because it is the latest, uppermost layers that are replete with tracks and footprints.

However, these tracks are not always associated with evidence of rain, when it should have been at its heaviest. Worse, it is the higher layers that record evidence that certain rock layers once formed the surface of the earth (before being buried by another layer) for more than just a fleeting moment. Nests of dinosaur eggs, for example, are known world wide. I use the word 'nests' carefully. They are not random fossilised eggs which somehow survived the raging waters until fossilised. Neither are they the 'excrement' of panicking dinosaurs fleeing the still rising waters: the eggs have been found in clusters, and even with young just hatching. It takes time for eggs to hatch – even if only a few days.

Since these nests occur at different levels each set of eggs has to hatch before the next. This can be accommodated after The Flood, but it is extremely difficult to envisage during The Flood, and within the first 40 days at that.

In short, fossil tracks and footprints are found too late in the sequence of events (forming the highest rock layers as they formed last) to fit the classical creationist model. We would have expected them at the lowest levels, quickly being buried by vast thicknesses, the upper layers devoid of tracks. However, if rocks bearing fossil tracks record evidence of rapidly propagating life after The Flood (flood layers being the great thicknesses of rock devoid of tracks), the picture is more comprehensible.

The Situation after The Flood

After The Flood, God commanded fruitfulness and multiplication to replenish the earth (Genesis 9:1). This divine blessing will be the clue, I suggest, for understanding the layers after The Flood, which were characterised by differing animals or plants finding conditions favourable for a season when they dominated the earth. After The Flood, conditions were unstable, and just as soon as a particular group rose to prominence, conditions changed and it quickly became extinct. The 'Age of the Dinosaurs' would thus be after The Flood, and record but one stage in the ecological recovery of the earth. The white cliffs of Dover are also post-Flood, recording a period of perhaps a few years when algae in the sea multiplied in unimaginable proportion. Doubtless this would have removed so much carbon dioxide from the atmosphere as to produce a reverse greenhouse effect which makes our present concern trifling in comparison, but then it does seem to have finished off the dinosaurs and precipitated the 'Ice Age.'

Getting Back on Track

I have attempted to explain why I believe many creationist viewpoints are in error. In the first article I maintained that it is untenable from the Scriptures to maintain that animals outwitted the rising Flood waters for long. Hence any attempt to explain the order of fossils on the basis of ability to evade the waters (man being the most

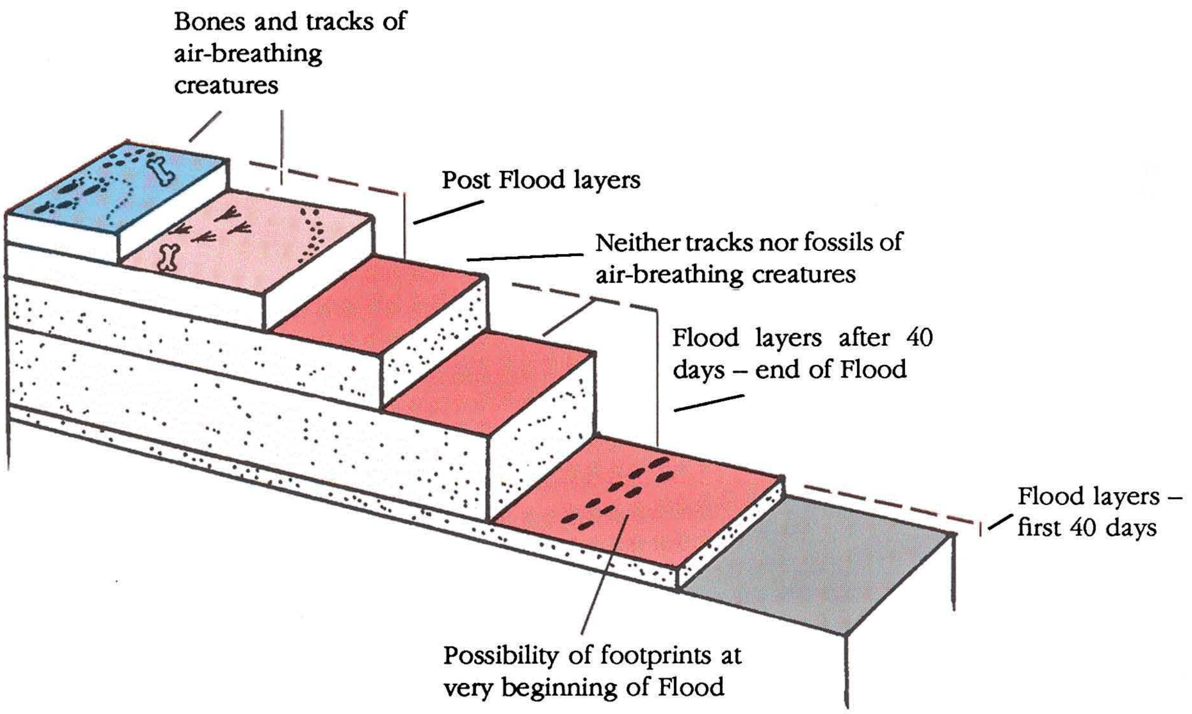

Bones and tracks of air-breathing creatures
Post Flood layers
Neither tracks nor fossils of air-breathing creatures
Flood layers after 40 days – end of Flood
Flood layers – first 40 days
Possibility of footprints at very beginning of Flood

Fig. 5: *A section through the Earth as suggested by inferences from Scripture.*

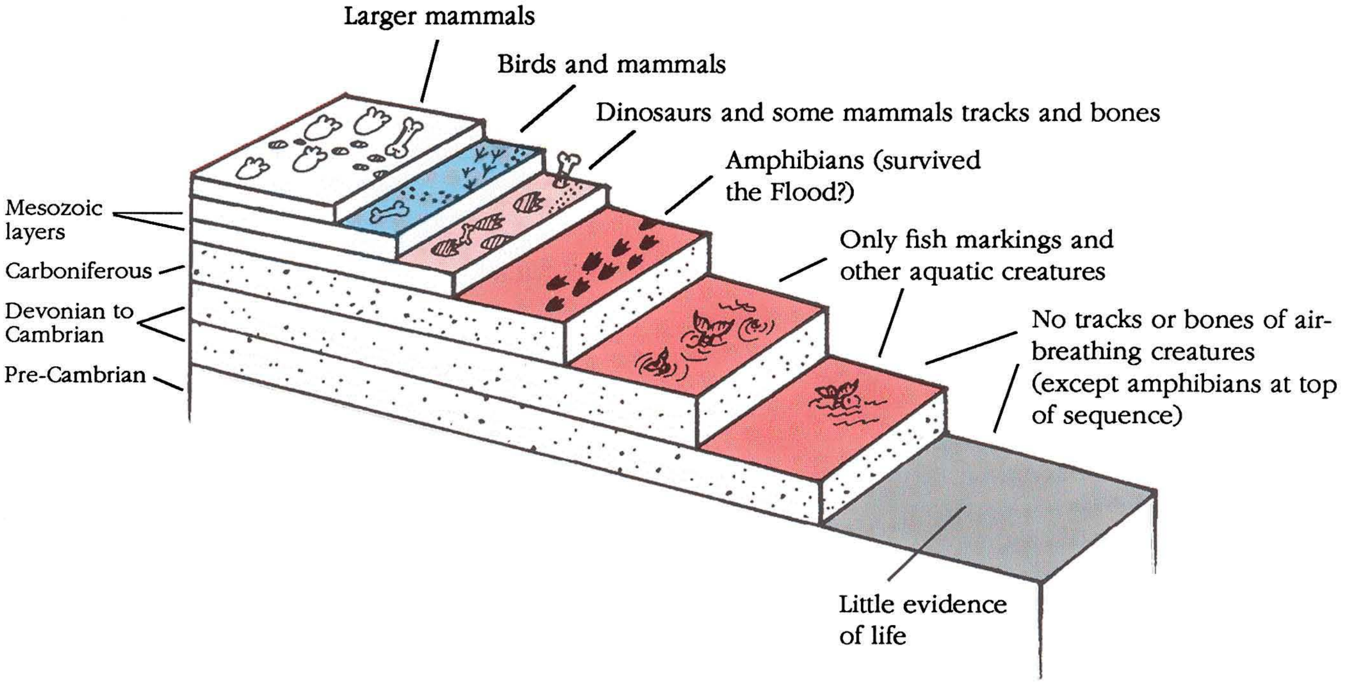

Larger mammals
Birds and mammals
Dinosaurs and some mammals tracks and bones
Amphibians (survived the Flood?)
Only fish markings and other aquatic creatures
No tracks or bones of air-breathing creatures (except amphibians at top of sequence)
Little evidence of life
Mesozoic layers
Carboniferous
Devonian to Cambrian
Pre-Cambrian

Fig. 6: *A section through the Earth – summary of what is found on every continent.*

Notice that the bones and footprints of air-breathing creatures appear in the uppermost (*i.e.* latest) layers only.

agile etc.) is quite erroneous. All air-breathing creatures quickly perished, and were certainly dead inside 40 days.

I went on to illustrate how several rock layers form vast sheets around the globe. Each of these vast sheets record an event in earth history – by peeling off each layer (like layers of an onion) a sequential earth history can be deduced, quite unrelated to any assumptions about evolution. I illustrated this from the various rock layers of Britain and Europe in the last article. This is in contradiction to so many creationists who, I suggest, have not looked on sufficiently broad enough canvas. They have failed to recognise the sequence is a fact of geometry (the layers of the onion). Instead they have seen the sequence as dependent on belief in organic evolution. The layers exist. They could be checked out by any sceptic in an aeroplane in a few hours! Within that rock sequence I have shown how the fossil tracks and footprints also conform to a particular order. In particular, tracks of air-breathing animals only occur in the uppermost (*i.e.* latest) of these layers.

I make this summary because I am aware just how entrenched are popular creationist ideas which I deduce to be untenable, and hence a hindrance to understanding. It is a pleasure to record my debt to John Whitcomb and Henry Morris for their book 'The Genesis Flood' bravely published in 1961. However, 30 years on it is important to improve on both the theology and the science of their classic text book. I am certain they were correct in asserting that The Flood deposited mile upon mile of rock very quickly. However, I believe their explanation of fossils was in error. Men and animals did not flee far from the rising waters. The distribution of most fossils (dinosaurs etc) has nothing to do with water sorting during The Flood.

Tracks – Life after The Flood

In this series of articles I will have challenged long cherished views of many creationists. My view has been that it is inescapable from Scripture that The Flood was worldwide, came suddenly, and quickly swept away all air-breathing life. There was little or no chance to flee to higher ground. Then I suggested that there is a definite order to geological events of earth history. Characteristic layers and fossils reflect those events. The layers rest one on top of another, often as sequential sheets around much of the globe. In this article I have shown how fossil animal footprints are distributed only in the uppermost of these sequential layers. Since all life was quickly destroyed in The Flood, such tracks are too high in the sequence to have been made in the very beginning of The Flood. It becomes impossible to maintain that they are Flood layers at all.

Explanations consistent with Scriptural principles are needful for what could be called the Post-Flood layers. For the moment I conclude that all the dinosaurs, mammals and other air-breathing creatures that adorn our museums are not relics from The Flood, but from after it. Compare mercy with judgement. In mercy, Almighty God freely offers forgiveness, the blotting out of sin, to those who come to Him in repentance and trust in the work of Jesus Christ. In judgement, the air-breathing creatures – including disobedient men – who lived before The Flood were also blotted out.

Acknowledgement and References

Dr. Joachim Scheven deserves credit for being one of the first to suggest considerable geological activity after The Flood. I gratefully acknowledge his generous assistance in my own research. The views expressed in this article are, however, my own.

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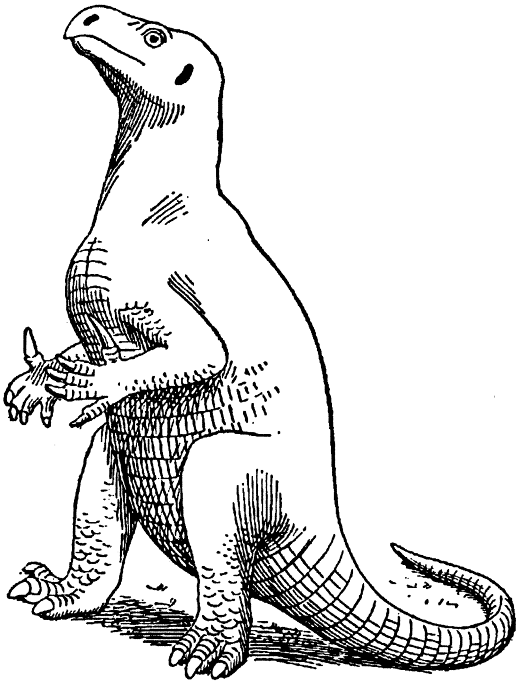

Seeing and Believing –

The Amazing Process of Human Vision

Sylvia Baker

THE process of human vision has been described as 'the most extraordinary and the most complicated functioning system on earth' (Gregory, 1970). We are so used to being able to see that it is hard for us to realize what a marvellous process it is. We are able, effortlessly, without making any conscious adjustments, to focus on far-away stars, on tiny print, on moving objects against a background of stationary ones and to know which is which and to do this in very dim light or in very bright light. What man-made machine could accomplish anything remotely like the eye and brain are able to achieve?

Those who believe in the Creator do not have to apologise for their position. It is self-evident that a system such as the human eye could not have arisen other than by design and planning. As it says in Romans 1, 'What may be known about God is plain ... because God has made it plain. For since the creation of the world, God's invisible qualities – His eternal power and divine nature – have been clearly seen, being understood from what has been made so that men are without excuse.' Nowhere is this better illustrated than in the study of human vision.

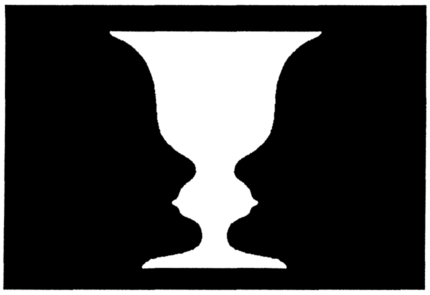

Figure 1

What, then, is the process of seeing? The first point to realise is that when we see, although it all seems so 'out there' we are actually experiencing something inside our heads. Destroy certain brain cells and the ability to see is lost. The brain is doing far more than just registering the information that has been received by the eye. It is analysing that information until it eventually comes up with a 'description' of the object that is being viewed. Look at figure 1! What is this object? What does the shape represent? Sometimes it looks like two heads and sometimes like a vase. It is as though the information coming in is not sufficient for the brain to decide which of the two it is meant to be. Illusions like this, and there are many examples of this sort of thing, can teach us quite a lot about seeing. For one thing, they demonstrate that vision is not in the least like a sort of photographic process whereby an image lands on the retina at the back of the eye and is transferred more or less directly to the brain. We are dealing with something far more complex than that. As David Hubel has said 'The eye has often been compared to a camera. It would be more appropriate to compare it to a TV camera attached to an automatically tracking tripod-machine that is self-focusing, adjusts automatically for light intensity, has a self-cleaning lens and feeds into a computer with parallel-processing capabilities so advanced that engineers are only just starting to consider similar strategies for the hardware they design ... No human inventions, including computer-assisted cameras, can begin to rival the eye' (Hubel, 1988).

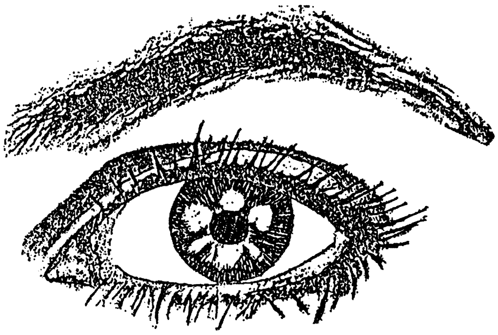

Figure 2

Let us now begin to work our way through the visual system, starting from the outside. Figure 2 shows the external protection that has been provided for the eye. The eyebrows prevent sweat and dirt from falling into the eyes. The eyelids, the upper one of which has its own muscle, also protect the eye via the blinking mechanism. The eyelid is complex in its structure, being composed of four layers. Firstly, the outside skin and eye lashes. Secondly, a muscular layer, necessary for blinking and closing the eye. Thirdly, a fibrous layer which provides solidity and stability to the lid. Fourthly, the conjunctiva, a very fine membrane which covers and protects the surface of the eye as well as lining the eyelids. The action of the eyelid is *vital* to normal vision. The eye cannot survive unless its exposed surface is kept continually moist. The eyelid achieves this by spreading tears across the surface of the eye every time we blink and during waking hours we blink every two to 10 seconds. During sleep the closed eyelid prevents evaporation and so the eye remains moist.

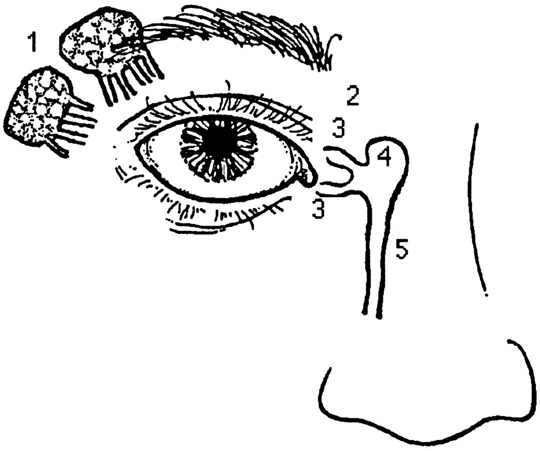

Figure 3

Figure 3 shows the system which produces the tears – the lachrymal system. The tears are produced in the lachrymal gland (1) and having lubricated and cleansed the surface of the eye, drain into the lachrymal ducts (3), then to the lachrymal sac (4) and so out through the naso-lachrymal duct (5). Even tears are complex and precisely designed. They consist of an inner layer of mucus, a middle layer of watery tear and an outer oily film to lessen evaporation of this watery tear. Besides keeping the eye moist and mechanically washing away any foreign material, tears also contain a powerful enzyme, a lysozyme, which kills bacteria by dissolving their outer layer.

The eye is supported in and protected by a bony cavity. This cavity is not simply a hole in the skull, but it can be seen to have been designed by the way several of the skull bones meet. The strong heavy bones ensure that protruding eyebrows and cheeks will shelter the eye.

Figure 4 is a diagrammatical section through the eye. The white of the eye, technically know as the sclera is shown (1). It is the outer protective coat of the eye and is made of collagenous and elastic fibres. In the front of the eye it becomes transparent, forming the amazing cornea (2). The cornea is a truly remarkable structure. It is composed of 5 layers of tissue, one of which itself consists of 200 plates with collagen fibres running though them, yet the cornea is almost exactly uniform in thickness and so perfectly transparent that most people are not aware of its existence. Fibres in each individual sheet run parallel to one another but at sharp angles to those in adjacent sheets. The outermost layer of the cornea is shed almost continuously and replaced by new cells from the innermost layer. It contains no blood vessels as these would interfere with vision. Instead, it absorbs its nutriment from the aqueous humour (3) behind it. The aqueous humour is 98% water and much like blood plasma. As well as feeding the cornea, the aqueous humour keeps the cornea round and firm and although it is continually absorbing fluid from the aqueous humour, it has a built in pumping action which pushes out the fluid as fast as it is absorbed. When light enters the eye, it first passes through the cornea and 75% of the of the task of the eye in bending and focusing the light onto the retina is done by this structure. To sum up,- the cornea does three things:

1. It is a tough shield to guard the eyeball.
2. It is a window to permit light to enter.
3. Its curved shape enables it to perform like the lens of a camera.

The cornea is so efficient that it transmits nearly 100% of visible light rays it receives.

In figure 4, you can also see the choroid layer (4). This contains pigment and blood vessels and forms the iris where it becomes visible at the front of the eye. The pigment absorbs extraneous light so that vision can be sharper. The blood vessels in this layer feed the rest of the eye, bringing food and taking away waste products. However, the choroid layer contains such a large number of blood vessels that there seem too many to just be involved in carrying food. It is possible that they are also designed to act as a cooling system. If you can focus the rays of the sun onto a piece of paper, you can produce enough heat to set it on fire. In the same way, as the rays of light focus on the back of the eye, there must be focused along with them a great deal of heat.

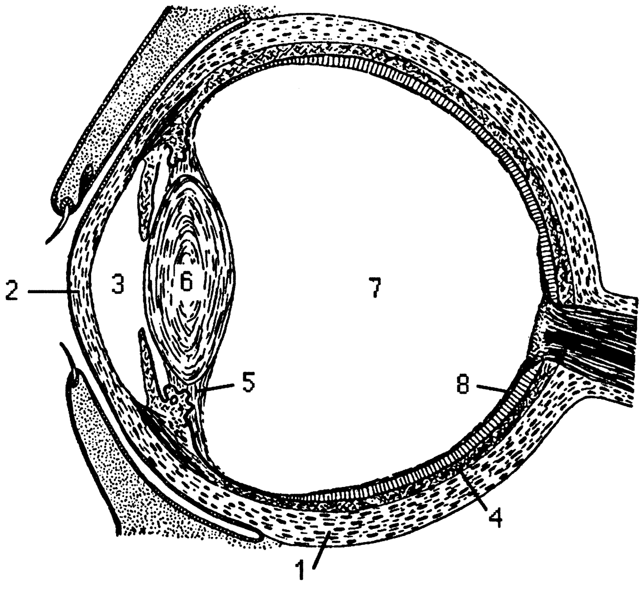

Figure 4

The iris (see figure 5) adjusts in size to alter the diameter of the pupil according to the light conditions. Around the pupil there are circular muscles which can squeeze the opening to a pinpoint, while other muscles run radially, like the spokes of a wheel, and these pull the pupil open.

The ciliary body (figure 4 (5)) is another vital part of the eye. It is made up of muscle and an inner layer of tissue which secretes the aqueous humour. The action of its muscle makes the lens thicker or thinner and hence accomplishes the fine focusing of the eye.

The lens (figure 4 (6)) is composed of long, highly elastic fibres arranged in sheets like layers of an onion, held in a thin transparent capsule to which are attached delicate ligaments from the ciliary body. There are no blood vessels in the lens and it receives its nutriments from the aqueous humour in front and the vitreous humour (7) behind. The vitreous humour is transparent, colourless and gelatinous. It gives the eyeball its firm round shape and keeps the retina firmly against the choroid. Its optical characteristics keep the rays of light in the path set by the lens.

Having passed through the cornea, aqueous humour, lens and vitreous humour, the light rays finally arrive at the retina (8) at the back of the eye. The retina has been called a 'tissue of superlatives.' It is the thickness of onion skin and looks like a pink net. It is barely the size of a postage stamp (UK regular size) and yet so complicated is the anatomy of the retina that it is in itself a complicated field of knowledge. We shall deal with it in detail later and shall then explain why the structure of the retina needs to be so complicated.

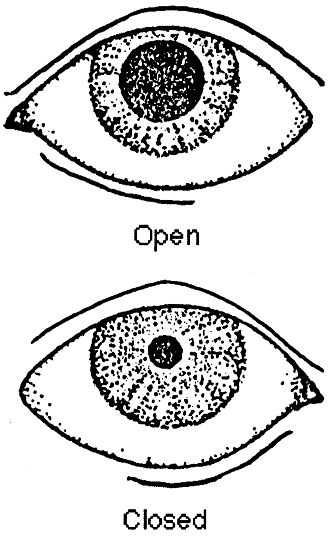

Figure 5

Attached to the outer surface of the eyeball are numerous muscles which control eye movement. Without them, vision would be impossible. They contract or relax about 100,000 times a day and the eyes move at a rate of thirty to seventy times a second. Why all this movement? There are at least two reasons. Firstly, to obtain the sharpest and clearest vision, the incoming rays must be brought to focus on the fovea, a very sensitive part of the retina. Therefore, in good light, the eyeball moves continuously as it attempts to focus the image of the object on the fovea. This structure is very small and therefore the eye movements must be virtually continuous as well as swift and accurate. Secondly, if the image is kept absolutely still on the retina, vision soon fades. The receptor cells of the retina adapt to the light falling on them and cease to send signals to the brain. Constant movement of the eyes is necessary to throw the image onto a new set of photoreceptors.

The muscles attached to the outer surface of the eye are also essential when we look at moving objects. There are two ways in which we can observe moving objects. One way is to keep our heads still and let the object move past our eyes. The image then runs across the receptors of the retina and in this way the brain is made aware that the object is moving. However, if we follow a moving object with our eyes, the images remain in the same place on the retina, yet we still perceive that the object is moving. Somehow, because the brain is aware that we are using our eye muscles to move the eye, it realises that the object must be moving and so we *see* it moving. Experiments show that as the command goes out from the brain to move the eye muscles, this *command* also affects the visual system to cause it to perceive that the object is moving.

This method is also used to keep the world stable when we move our heads. Whenever we move our eyes or head, the image of the room rushed across the retina in just the same way as it would if the room was moving and yet we do not see it moving. It seems that the message 'room moving' does leave the retina, but then it is cancelled out by the message from the brain, 'head has just moved, therefore room is not moving.' Experiments show that the cancelling command signal from the brain is beautifully designed to arrive at the right part of the brain at the same time as the message from the retina. The message from the retina takes a little time to travel to the brain and exactly this amount of delay is put into the command signal.

In clinical cases when something has gone wrong with the eye muscles or their nerve supply, the world does swing round when the patient tries to move his or her eyes. Remember, too, that if the muscles of the two eyes were not perfectly co-ordinated, binocular vision would be impossible and one would see double all the time.

In *Origin of Species*, Darwin said 'To suppose that the eye, with all its inimitable contrivances ... could have been formed by natural selection seems, I freely confess, absurd in the highest degree.' With that we would entirely agree and remember, Darwin had no idea of how amazingly complex the visual system would turn out to be. We have been considering the major structures of the eye itself which would have been known to Darwin. Next we shall look at the results of the past 40 years of research into the process of seeing. The part played by the retina and the visual parts of the brain has turned out to be more astonishing than Darwin could possibly have imagined.

References:

Gregory, R. (1970). *The Intelligent Eye*. p. 60.
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A Challenge to Theistic Evolutionists

A Survey of Recent Books

by Arthur Jones

1. **Genesis, Geology and Catastrophism. A Critique of Creationist Science and Biblical Literalism.** Michael R. Johnson, Paternoster Press, 1988, 171pp.
2. **Creation or Evolution – A False Antithesis?** M.W. Poole and G.J. Wenham, Latimer House, 1987, 84pp.
3. **Darwin's Forgotten Defenders. The Encounter between Evangelical Theology and Evolutionary Thought.** David Livingstone, Eerdmans/ Scottish Academic Press, 1987, 210pp, £7.95.
4. **Cross-currents. Interactions between Science and Faith.** Colin Russell, IVP, 1985, 272pp, £7.95, Chapters 7-8.

THE first two books defend theistic evolution and a non-literal understanding of the Genesis creation account. However, the book by Poole and Wenham is seriously mistitled: there is little or no discussion of biological evolution, the book focusing on the age of the earth. (As an aside, it is worth noting that book after book identifies this as the key issue.) Both books are very unsatisfactory in their treatment of creationism. Of Johnson's 13 creationist references, only one is a technical paper (Slusher's monograph on radiometric dating) and only two were published in the 1980's. Poole has 23 creationist references, but only three are technical (Barnes's monograph on magnetic fields written in 1973 and items from the Setterfield debate on the speed of light). These very few technical references deal with the single issue of the age of the earth. This hardly inspires confidence in their handling of the whole creation/evolution debate. That aside, I would question the whole propriety of this kind of evaluation.

Both books assume that creationists habitually grasp at scientific straws. That is not at all true. One of the virtues of the creationist position is that it gives the researcher tremendous freedom: there are many options open to us within the Biblical framework, in contrast to the limited options available to the evolutionist (who is committed to evolutionary continuity, an old earth etc). All the technical articles mentioned above refer to matters which are viewed by creationists in just that light: options which are possibilities within their framework and therefore well worth pursuing. They have all been critically scrutinised *by creationists* from the beginning and are subject to on-going debate in the creationist journals. None have been anything like universally accepted by creationists. Some options have been generally rejected as a result of the debate; others are still maintained and ably defended. This is entirely as it should be and creationist science is currently a very exciting and challenging enterprise. Of this our two books gives no hint. Nor would the depth and range of creationist studies be suspected from these books. For example, both refer to the use of the Biblical 'kind' by creationists and both state or imply that creationists have done little or no study of either Biblical of scientific data. As that ignores, or is ignorant of, the detailed studies of many creationists, including the author of this article, one can only conclude that the authors of these books were not really serious in their consideration of creationism. Clearly it would be easy to produce a similar very selective, often inaccurate and long out-of-date survey in evolutionary science (and one must be honest and say that some creationists have done this). It would save a lot of expense and valuable writers' and readers' time if we admit that the exercise proves nothing concerning the evolution/creation question, though it does carry a not unimportant message on the extent of our ignorance in all fields of science.

More disturbing is the way both books deal with the Biblical passages. Both defend or encourage a non-literal interpretation of Genesis and Johnson argues for no direct correlation between Genesis and empirical history at all;

> 'The reinterpretation of relevant Biblical passages … (is) the key to the whole problem.' (p. 11)

Wenham, as a Biblical scholar, is more circumspect, admitting that:

> 'By and large they (Genesis 1) are written in straightforward Hebrew prose.' (p. 22)

He admits that the traditional literal interpretations cannot be ruled out (*e.g.* pp. 30-31). However, he labours hard to make room for an interpretation which does not contradict scientific orthodoxy. Yet again that is clearly the bottom line. The authors of these two books believe that science (*i.e.* biological evolution and geological uniformitarianism) rules out any literal interpretation, therefore Genesis must be interpreted in another way and (for Johnson) one's whole approach to Biblical interpretation must be reconsidered. Again we can only indict the authors for failing to come to grips with the depth and range of Biblical studies that support a creationist position or, indeed, with critiques from such liberal scholars as James Barr.

This brings us on to the two historical studies by Russell and Livingstone. Their approach (implicitly or explicitly) is to discredit modern creationism by rehearsing the 19th century debates so as to show that:

(a) many leading evangelical scientists accepted evolution
(b) modern creationism is best illuminated (and dismissed) by considering its Victorian forebears.

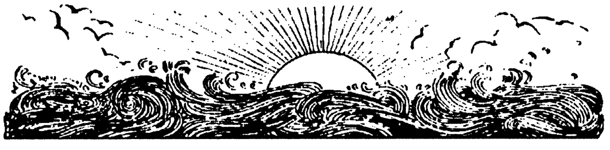
There is a major assumption here, the assumption that the interpretation of scientific data is much more certain – or much less ambiguous and more open to probing and testing – than that of Scripture. This confidence in science as *the* way to the truth goes back all the way to Galileo. In that classic confrontation, the church experts were as overconfident in their interpretation of Scriptural data as Galileo was in his interpretation of scientific data. Instead of subjecting that whole (shared) concept of knowledge to Biblical critique, we have been trapped in that secular polarisation ever since. For a long time the pendulum has been stuck on the side of science and we need to heed the studies in the philosophy and history of science (by *e.g.* C.S. Lewis, M. Polanyi, T. Kuhn, G. Radnitzky and P. Feyerabend) that have exposed that 'emperor's nakedness.' These are big issues which our authors sadly bypass, but those who wish to follow them can start now with Mark Roques's excellent new book, *Curriculum Unmasked* (Monarch, 1989) which explores the Biblical concepts of knowledge and wisdom and maps the outworking of secular and humanist assumptions throughout school curricula.

Finally, it must be pointed out that appeals to history are always double-edged weapons: that kind of historical study can also be used to illuminate the poverty of modern theistic evolution. To say that God created animals and plants by a process of evolution can appear to solve the problems and release us from conflict with modern science. Does it, however? What actually does theistic evolution mean in reference to science?

Livingstone notes that in the 19th century (and up to the 1920's), the debate centred on the question of design, whereas in the 20th century it has centred on the *authority of the Bible* (p. 166). That is true enough, but we need to probe deeper. The controversy around design provided a focus for a deeper issue – the nature of science. The Darwinian controversy was not so much science versus religion as 'religious science' versus 'secular science.' The ideals of the Enlightenment were gradually working through the sciences. By the early 19th century, physics and astronomy provided models of positivistic (as opposed to theologically-grounded) science (*e.g.* Laplace's celestial mechanics and nebular hypotheses). Lyell's *Principles of Geology* (1830-1833) was soon to provide a paragon for geology and Darwin an exemplar for biology. Of course, some scholars have argued that there is no logical connection between geological uniformitarianism and biological evolution. That is certainly true, but is beside the point. The connection was actually very real and very effective and still is to this day. They are powerfully connected as paragons of positivistic science, in their commitment to a thoroughly naturalistic explanation based on material causes and the uniformity of natural law in a closed system. Tied up with this has been the question of the intellectual autonomy of science, its freedom from theology and its claim to cultural dominance. That is the background for any consideration of theistic evolution.

In the first place, it is a fallacy to assume that theistic evolution carries no implications for scientific research. No story-explanation (as this is) can be given without a tacit appeal to laws, at least in the sense of law-like generalisations. Just *how* does God create by evolution? There are many possible answers, of which most, if not all, were explored in the 19th century. The *'nomothetic'* evolutionists believed that God controls the end of evolution, *i.e.*, that He planned (designed) it all from the beginning and framed all the natural laws accordingly. Taken to extremes, this rules out significant chance events altogether – the whole course of evolution is rigidly predetermined. Alternatively, chance could determine when the right variations are thrown up for selection, so that God sovereignly determines the end, but not the means, *e.g.*, only the right mutations can be selected, but chance determines when (or if?) they are offered. The *'providential'* evolutionists believe that God controls the means in order to reach His ends, *i.e.*, God manipulates the laws of heredity or development in some way or intervenes in the processes of variation (*e.g.* so that the right variation occurs at the right time). Now the point is that all these positions are found today in the theistic evolution literature and all carry implication for research programmes. All – and this is the point that must be emphasised – are as unacceptable within the dominant positivistic ideologies as is straight creationism. Indeed the infamous 'god of the gaps' appears to be alive and well in the theistic evolution camp.

Here then is the challenge to the theistic evolutionists. You seek to critique creationism in some detail, but are rather vague about your own position. Spell out your own position and start to work out its implications for your own science. Creationists have certainly come above the parapets onto the scientific battlefield. In doing so, they have drawn much fire and sustained damage. But they have advanced into enemy territory. Theistic evolutionists may appear to be scientifically sounder, but it is the soundness of those who have never fought, not of those who have fought and won.



Reviews

The Discovery of Noah's Ark, by David Fasold. Sidgwick & Jackson, London 1990, 331 pp, £14.95

Reviewed by J. H. John Peet

WE are sometimes asked questions like, 'If it is proved that the Ark has been discovered on Mount Ararat, won't it convince the sceptics of the truth of Scripture.' Of course, it is impossible to prove such an identification in a scientific sense, but it would be interesting and encouraging to Christians if such a discovery was made. However, we are reminded that the Lord's enemies did not believe even when He rose from the dead.

David Fasold believes that he has found the Ark, not on Mount Ararat, as many believe it to be, but on another mountain some 25 miles away. The discovery has a conventional boat shape and is of dimensions consistent with Scripture. The Turkish government has subsequently spent a lot of money making this into a national park and trips to the site are now advertised. But, is it the ark?

Not only am I sceptical about the identification, but I am more concerned about the author's approach. This is a dangerous book which is to be widely distributed through a historical book club.

The book is confused in its approach and often difficult to read. It is a mixture of data, biography, politics, mythology and some Scripture. I believe the author probably claims to be an evangelical, but he slates 'fundamentalists' and 'revisionists' as he identifies them. Some of his criticisms of their approaches are valid, but I am not sure that he is any better!

Though the author's background is as a mariner, he presents evidence from a variety of ancient sources. Either his knowledge of chemistry is poor or he is a bad proof reader (pp. 272-273). As one who can claim some expertise in that area, it leaves me sceptical of his claims in areas that neither he nor I understand properly!

He claims to have used a metal detection system which has shown that there is a metal structure to this proposed 'boat.' Most investigators are convinced that the formation that has attracted Fasold's attention is only of geological significance. The shape could be due to the dynamics of flowing material down the hill. Dr John Morris has made a careful geological survey of the area (in *Creation Ex Nihilo*, 1990, 12(4), 16-19) and finds that the supposed metal structure is due to natural manganese nodules. In fact, Fasold's detection system (which is not described in the book) is nothing more than 'dowsing' with brass rods. Genuine metal detectors and radar instruments do not confirm Fasold's claims.

He makes much of 'drogue stones' which, the reader supposes, are found near the formation and acted as anchor stones. In fact, these stones are located many miles from the site and there is no reason to believe they are connected with the supposed ark.

The author also claims to have solved a number of riddles. The ancient Egyptian vizier, Imhotep, was Shem. He built the pyramid with the intention of burying Adam's bones there, the 'centre of the earth.' Oh, by the way, Shem = Imhotep was also Melchizedek and Typhon of Egypt. There are more such 'gems' in the book.

According to Fasold, Noah was in control of the navigation of the Ark throughout its 'voyage' and the sons were the offspring of his three wives and so continued the lines of Tubal-cain (Ham), Abel (Japheth) and Seth (Shem)!

Another popular type statement is that 'It can be proven mathematically that mankind could not reach the present population in less than fifty-three hundred years.' This shows an ignorance both of Biblical data on family sizes and also of the study of population dynamics.

The serious flaw in his approach is that the Bible is his secondary source. He bases his book on ancient myths and 'corrects' the Bible and the translators on the basis of them. I find this approach very disturbing. He claims, for example, that the Babylonian text was 'much earlier' than the text of Moses. This is a common claim but is unproveable. My copy of the Scriptures may have been printed in 1970, but it is a copy of a much older document. Our earliest copies of the Scriptures are copies of much older documents. Who is to say (on rational arguments) that the Babylonian text predated the earliest Biblical one. The author makes nonsense of his own argument by referring to the ancient writings (pre-Flood) being carried in the ark by Noah. If so, they predated the Babylonians!

The book is not well written. It is not helpful, but speculative. It interweaves myth, Scripture and personal conjecture. It is not recommended!

Wonderfully Made, by Dr. A.J. Monty White. Evangelical Press, (1989). 128pp. £3-95.

Reviewed by David Watts

WHY another book on Origins? Dr White addresses this question on p. 17, declaring his intention to focus upon the crux issue of human origins. In this carefully circumscribed aim he succeeds where some others have failed – with tomes full of ill-digested information.

Dr White begins with the question 'Does it matter?' – creation that is! Concisely he summarises the conflict with secular humanism and some of the social consequences of a creation-denying Godless education. His next task is to explain evolutionary thinking as a foil to Biblical creation. At this point Dr White might easily be *mis*construed as anti-science, because part or all of the particles-to-people scenario he surveys is integral to the popular understanding of science. Moreover, there are aspects of scientific cosmogony, such as the Big Bang singularity, which the reviewer believes may chime in well with Biblical cosmogony. If so, it is an unfortunate stumbling block to lump this in with human evolution. I missed here [p. 10ff.] the crucial distinction between absolute and mediate creation. Nevertheless, Dr White is quite correct to insist that the secularist has fabricated a comprehensive evolutionary world-view of which human evolution is but an integral part. Although we are faced with the task of promoting changed views on many fronts, human identity is the question of universal interest and basic importance.

Two central chapters are concerned with fossil evidence. So here Dr White may rehabilitate himself in the eyes of the sceptical reader by displaying a concern for the documented scientific facts of the case. He further raises his credibility rating by praise for Dr John Morris who was instrumental in the withdrawal of the erroneous *Footprints in Stone* film. Much of the material on fossils is accessible elsewhere but Dr White's presentation is of a high standard. The next chapter relates to classical criticisms of past and present evolutionary thinking: embryonic recapitulation, vestigial organs, comparative anatomy, etc.

With the penultimate chapter we come to the decisive Old and New Testament material on Adam. This is well handled, leading on to a critique of Professor R.J. Berry as a representative evangelical theistic evolutionist. Most interestingly, Dr White illustrates the entirely proper and legitimate way in which science may illuminate the Biblical narrative. This emerges especially on p. 99f where tentatively he concludes that Adam may have had the outward bodily appearance attributed to Homo Erectus rather than Homo Sapiens. Buy the book to read his reasons!

Finally Dr White draws his readers to the fuller unfolding of the Biblical narrative, leading from Adam to Noah and on through the Old Testament to the coming of Jesus Christ. This brings us to the Christian gospel and helpfully bridges any gap that might otherwise be apparent between God the Creator and God the gracious Redeemer of repentant sinners.

This book is one of the most lucid and accurate popular treatments of the key issues ever to have been published in the UK. It is of no small importance that this book originates from within our own British culture and bears witness to the truth here in a hostile climate where Dr Peter Atkins of Oxford University describes 'creationism' as '... intellectual excrement of the first order.'

The volume is attractively bound and typeset and represents good value for money at today's prices.

Curriculum Unmasked, by Mark Roques with Christians in Education. Monarch Publication Ltd, 1989, 255pp, £5.99

Reviewed by Peter Butterfield

AT FIRST glance, it may seem unusual to see a review of a book on education in our journal, but as this book clearly exposes the evolutionary philosophy underlying our school curriculum, I would argue that it is important to bring it to the attention of readers.

The stated purpose of the book is to expose the underlying secular and humanist assumptions behind aspects of the curriculum and to bring them to our attention. Further, it is the intention of the author to encourage a positive, Biblical perspective on education, I would encourage the reader, whatever the subject of his or her interests, to read the book in its entirety to gain a full picture. The book is well-structured; it is divided into three parts which I shall look at separately.

Part 1: The Context of Education

In these first chapters, Mark Roques juxtaposes the Biblical view of education with the secular, showing how totally opposite they are to one another. He then follows the course of development of the latter view, with its emphasis on idolatry and false wisdom, through the Old Testament, to the so called 'Age of Enlightenment' to the 1980's, with its faith in science and technology to solve our problems. This is a useful section because of the importance of understanding present situations in their historical context so as to shed light on root causes.

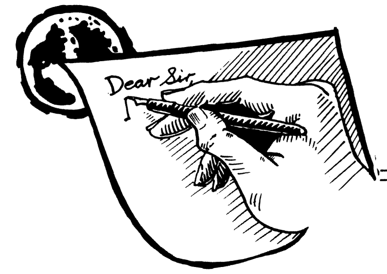
Part 2: The textbooks

Textbooks reflect and have considerable influence over what is taught in schools. Mark Roques takes exception to the fragmenting of knowledge into separate disciplines, but realises the need to review according to subject. The textbook contents of most commonly found subjects are examined, although not exhaustively. For example, the section on science begins by taking a critical look at the implications of a passage from a biology textbook describing the evolution of life. Evolutionary assumptions and the optimistic humanism of today's technology are likewise analysed. The wisdom of man and his belief in his own rationality is contrasted with his view of the indoctrination of so called irrational faiths such as Christianity. On the subject of English, the comment that 'a powerful and prophetic Christian perspective is almost never made' seems to be a recurring theme throughout the book.

Part 3: A Christian Response

This section is clearly the most important, as it leads to the positive input that Christians can bring to the children. The approach taken is interesting: instead of the expected prescription of 'what Christian teachers *ought* to be doing,' Mark Roques shares the experiences of various teachers. This is interesting because the ideas are practical. The section is divided into subjects and again, I would encourage its entire reading. The reader may not agree with all that is suggested, but the author hopes that these 'snapshots' will provide a valuable starting point for our own responses.

In conclusion, I would recommend this book to teachers, parents and church leaders and any others with an interest in education. It provides a valuable stimulus to our thinking as it lays before the reader the scene and then points the way towards more thought, prayer, study and work in the whole area of our responsibilities towards those in our charge.



Correspondence

D. Wonderly

D. Wonderly writes thanking us for publishing his article in *Origins* 3: 9, but expressing his concern that we had omitted some of the primary data relevant to his arguments. We publish this below with enough of the text from *Origins* 3: 9 for its intended position to be deduced. Those interested in following up the primary sources for which page numbers had been omitted in the article are invited to contact the editors at the PO Box address.

Section omitted from p. 10 of article:

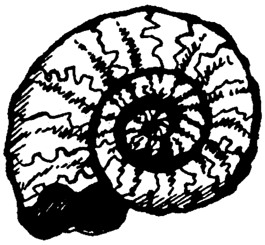
Many of the limestone formations are hundreds of feet thick, and it is not uncommon for such a formation to be a few thousands of feet in thickness (Chen, 1977, p. 26-67). In most parts of the world the crust contains several limestone-containing formations lying in vertical sequence. Often the lower ones are a few miles below the surface, and usually there are some thick, non-carbonate formations (shale, siltstone, etc) lying between the limestone formations....

In order to think accurately regarding the origin of the limestone strata of the earth we need to reckon with the immense amounts of this rock which exist, and also with the precise makeup of the rock material in the strata. Sanders and Friedman (1967, p. 193) give the following summary statement (using 'limestone' in the general sense which includes dolostone):

'Limestone occurs in all parts of the world and at all levels in the stratigraphic column, though probably it is less common in the ancient Precambrian strata. Limestones have been estimated to comprise 19 to 22% of the available measured stratigraphic sections.'

The percentage range stated in this quotation has been confirmed many times, both before and since publication. In agreement with the 20% figure is the fact that the average thickness of limestone (including dolostone, see footnote 6 in article) in the sedimentary cover of the eastern two-thirds of the United States (east of the Rocky Mountains) is 900 feet (270 m). Of great significance is the fact that several states in the interior of the US from 400 to 700 miles (640 to 1120 km) inland have 270 m of limestone covering almost all of the state, and in the large area known as the Central Appalachians, lying from 150 to 350 miles (240 to 560 km) inland and extending 500 miles (800 km) NE-SW, the thickness of limestone usually exceeds 5,000 feet (1,500 m) with an average of approximately 15,000 feet (4,500 m) of non-carbonate strata at various levels in between the limestone formations (Chen, 1977). Thicknesses of limestone similar to those of the USA are found in some localities, far inland, in Canada, Europe, Asia and Africa.

Thus, no method is known to mankind by which even a small fraction of the existing limestone strata could have been deposited by either precipitation or rapid transport of shell materials. During the last three decades, the worldwide, extensive research of carbonate sedimentology has provided us with abundant evidence that most of the limestone strata of the earth are of biogenic origin, and were formed by natural processes in the environments where the lime-secreting organisms were growing. Petrographic studies of limestone have revealed much regarding the components of which it is made up and the conditions under which the cement crystals which bind the granules together were precipitated. Carbonate sedimentologists have carried out many extensive research projects of observing the rock-forming processes in action in continental-shelf areas, in coral reefs, and in some other parts of the world. Also, the presence ...



J. Scheven

Excerpts from J. Scheven, who writes in connection with the article by D. Wonderly.

The author appears to argue mainly from the conditions prevailing in NW Alberta. The hydrocarbon-bearing limestones there are conventionally regarded as *in situ* grown coral reefs. This is simply not true. The fabric of the alleged Middle Devonian 'reefs' is only known from drill cores, *i.e.* from extremely poor exposures. The same type of coral limestone occurs in other parts of the world in magnificently exposed sections. There is not the slightest doubt that these massive limestones are a jumble of reef fragments – both small and great – deposited, eroded and re-deposited during an extremely violent episode of earth history. The entire Palaeozoic sheet of NW Alberta is a platform deposit with the organic remains of pre-flood frame-builders spread out more or less evenly. The so-called atolls of Devonian coral reefs are totally unrelated to present day atolls of the Pacific, since the latter rose around a subsiding elevation of the sea floor whereas the Alberta 'atolls' did not form in this manner. No real atoll contains intercalations of 'terrigenous sandstones, siltstones and shales,' a condition almost universal in Palaeozoic 'reef' limestones. I repeat, the Palaeozoic limestones made up of frame building organisms are stratified sediments and must not be mixed up with post-Palaeozoic limestone units which may contain *in situ* grown organisms ...

I wish to emphasise that fossils (dead organisms) cannot have formed prior to the Fall, approximately 6,000 years ago, according to Romans 5: 12. More specifically, fossils cannot have formed before the catastrophic conditions for burial and lithification of organisms had arisen. Taking the Bible at its Word, this was not more than about 4,400 years ago. It is a weak starting point to argue the case for Biblical earth history from natural reason, from the consensus of the secular scientific community and from the principle of uniformitarianism. Personally, I should like to see *Origins* used to instruct rather than to dispute.

P. Garner

[Editorial comment: Normally we would only publish short letters, but, because of the importance of the contents, we have reproduced Mr. Garner's letter in full. Mr. Garner is a graduate in geology and biology.]

It is fair to say that Daniel Wonderly's paper ('Pre-Flood Limestone Deposition,' *Origins* 3: 9, pp. 10-15) contains many scientific points which need to be addressed by young-earth, Flood-geology creationists. However, I do not think that the situation is as desperate for Flood geology as Wonderly would have us believe.

For example, Wonderly claims that there is abundant evidence that most of the limestones of the earth are biogenic in origin (p. 10). However, Woodmorappe (1987b, p. 216-7) says: 'This uniformitarian belief stems from actualistic analogies with modern carbonate environments and is not based on petrographic analyses.' Furthermore: 'Grain-sized constituents of limestones are demonstrably organic in origin, and conventional petrographic microscopes can be used to identify the organisms producing the skeletal material. However, most limestones are micrites, and most micrites are indefinite as to their origin' (Woodmorappe, 1987a, p. 209). Nevertheless, in his paper Woodmorappe takes the extreme assumption that all limestones are of biogenic origin. He then proceeds to perform calculations which show that it is possible to account for the amount of limestone in the earth's crust within a short timescale, even if it were 100% biogenic.

Wonderly criticizes the concept that skeletal material in limestones was transported and deposited by the Flood. However, I think that it is probable that most of these criticisms are the result of the incompleteness of our knowledge as to the nature of the Flood events. This is only to be expected since, as Coffin (1983, pp. 11, 13) has pointed out,

'Those who believe in a major world catastrophe in the past history of the earth are unable to make good comparative studies because no modern analog exists.'

Nonetheless, uniformitarianism also seems unable to adequately explain phenomena such as crinoidal limestones, extensive chalk beds, coquinas, etc. so it seems reasonable to look for catastrophic explanations.

Wonderly cites the existence of *in situ* growth structures in carbonate sediments as evidence of long periods of formation for these strata (pp. 10-11). I concur with Wonderly that if true *in situ* growth structures requiring extended time periods for their formation are found in certain strata then this would be fatal for the notion that the Flood formed these layers. However, such structures have often been subject to reinterpretation.

Many so-called 'stromatolites' may in fact be inorganic structures (eg. Hofmann, 1971, pp. 30-4), while other algal mat-like structures may have been formed rapidly during the Flood (Nutting, 1984, pp. 23-4, 86-7). In a recent issue of *Origins* Scheven (1990, p. 8) refers to Precambrian 'stromatolites,' some of which 'only bear a remote resemblance to the stromatolitic growth in the later strata of the Phanerozoic.'

Philcox (1971, pp. 343-4) draws attention to allochthonous (*i.e.* transported) coral and stromatoporoid colonies in the Silurian Gower Formation of Iowa:

'A large number of colonies lie on their sides or upside-down within the sediment, and obviously are no longer in growth position. The majority of flat-based favositid colonies lie upright, but since this is their most stable orientation, they may have rolled into this position. In the absence of other evidence they should be regarded as ambiguously situated. It is frequently claimed in the literature that a given upright colony is in its growth position, implying location, when the evidence really only shows the colony to be in its growth orientation. It is sometimes difficult to establish whether upright colonies were buried where they grew. For instance, rolled conical or cylindrical colonies would come to rest in an upright position if supported by projections in the substrate or by other colonies. Even apparently quite stable stromatoporoid colonies, that interfinger at their margins with the sediment, are sometimes found inverted – they appear to have rolled together with the adjacent trapped sediment!'

This is a lengthy quotation, but it is important in that it shows that there is more to the interpretation of supposedly *in situ* structures than Wonderly implies. During an undergraduate field course I had the opportunity to examine some stromatoporoid mounds in the Devonian Daddyhole Limestone of Triangle Point, Torquay. Upon examination it was found that these colonies had undergone abrasion during hydraulic transport and were therefore allochthonous. Indeed, it is interesting to note that even uniformitarians now consider there to be little in the way of true *in situ* structures in the Devonian of south-west England.

Braithwaite (1967) notes that much of the physical evidence of the carbonate rocks of south Devon suggests rapid depositional processes – for example, thick, muddy beds packed with disorientated fossils are common. Therefore, he has to assign the 'missing' geological time to hiatuses in the sedimentary sequence (Braithwaite, 1967, p. 316):

'Overall rates of carbonate deposition need not have been fast. If one puts the Givetian interval arbitrarily at 10 million years (perhaps excessive) this would not require rates of more than 1mm in about 27 years. Since it seems likely that even the thickest beds were deposited very much faster than this, the bulk of the time is represented by bedding planes and other discontinuities.'

A simpler solution to this problem would be one that takes the physical evidence at face value – in other words, rejection of the imaginary timescale for the Devonian.

Wonderley's treatment of the stratigraphic separation of fossils (pp. 11-3) neglects the hypothesis that the pre-Flood world may have hosted a number of different marine and freshwater environments isolated at different altitudinal levels, as proposed by Clark (1946). This would help to account for the fact that different coral assemblages are encountered at different levels in the sedimentary sequences of the world. As for microfossils such as diatoms and radiolarians, research is required to demonstrate a viable Flood model for their stratigraphic distribution. However, progress has been made with reference to foramenifera (see Tosk, 1988), so the future task of explaining the zonation of other microfossil types may not be as hopeless for creationists as Wonderly maintains – further research may well provide answers to the criticisms expounded in his paper. It is also important to note that development of biostratigraphic models within a Flood paradigm is hindered by the absence of data necessary for the task in the orthodox literature. For example, Tosk (1988, p. 8) notes that species descriptions may not give details significant to the study of the transport characteristics of fossil organisms (*e.g.* buoyancy).

More important than scientific considerations, however, is our understanding of Scripture. I believe that the reasoning expressed in Wonderly's paper is fundamentally flawed because of the author's tacit acceptance of pre-Fall death and suffering. The Bible consistently portrays death as an unnatural intrusion into the original created order. Death is viewed as a curse because of man's sin. To accept that death was universally present prior to the Fall (indeed, prior to the appearance of man) appears to be contradictory to scriptural teaching about the origin and meaning of mortality. A paper by Van Dyke (1986) covers this theological problem, and although he is mainly criticizing theistic evolution many of his arguments are also applicable to old-earth creationism. This article is recommended reading on this theological/doctrinal subject, as is Stambaugh (1989).

In conclusion, I would like to quote Wise (1987, p. 200) who advises, 'Creationists need to study much about the deposition and lithification of sediments. It seems possible that under catastrophic conditions any sediment can be rapidly deposited and rapidly lithified. For example, an understanding of the formation of beachrock and allied limestones as well as the diagenesis of carbonates may well lead us to an understanding of how all the limestones of the earth came to be.'

I realize that this response has not addressed all of the issues raised by Wonderly's article, both for the sake of brevity and because not all the answers are available yet. The formulation of adequate responses to every major criticism of Flood geology will take many lifetimes of research, and modifications of our Creation-Flood models are sure to come in the process. This is not, however, an argument for abandoning Flood geology entirely. We ought to pray that God will supply the creationist movement with increasing numbers of talented geologists who will be able to give their talents for the purpose of developing some of the answers we need.

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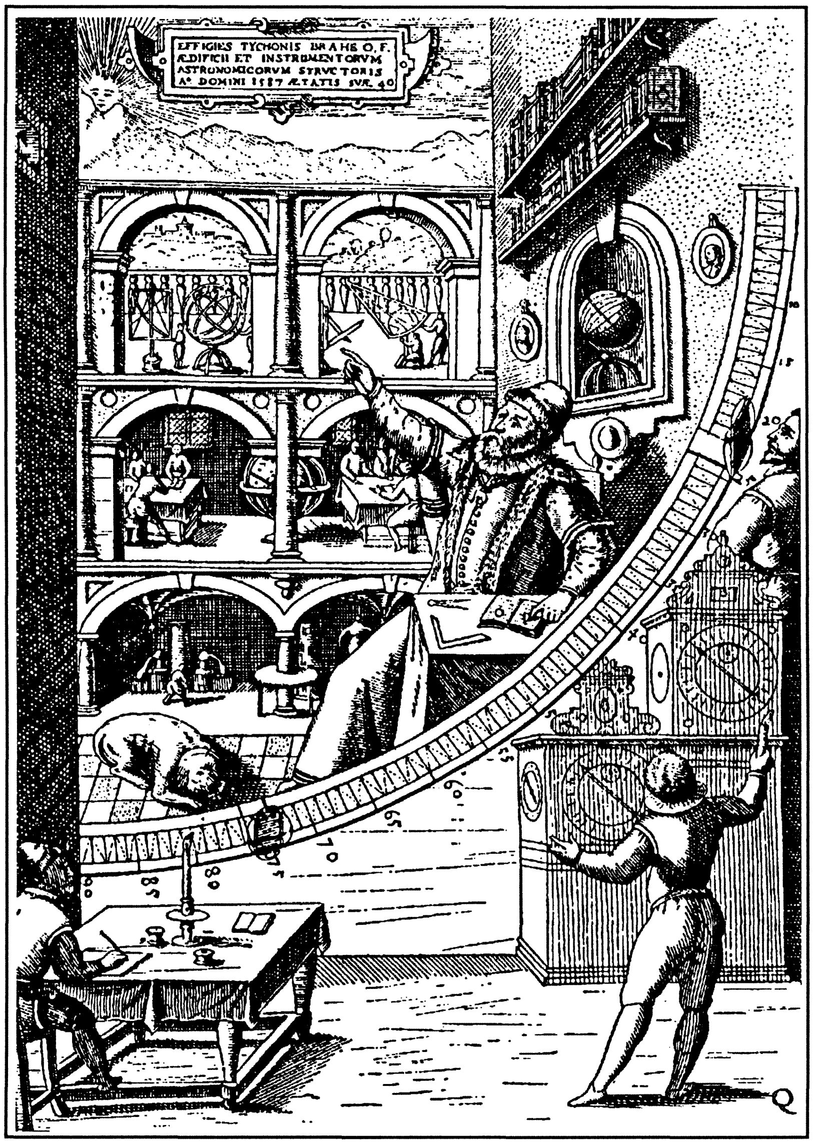
* The journal referred to here is not the BCS journal, but another *Origins* published by the Geoscience Research Institute (GRI), Loma Linda University, Loma Linda, California 92350, USA.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News of Creation

The Second International Conference on Creationism

David J. Tyler

FOLLOWING the successful launch of this conference in 1986, the organisers have worked very hard to maintain and improve the event. The general feeling among those who attended this year was that the 1990 conference had set new standards of excellence and represented a major step forward for creationism. The organising committee achieved a notable success in their thorough preparation and smooth execution of the programme. The conference sessions were recorded on audio tape and on video, and two hardbound volumes of published papers record the proceedings. The 2nd ICC was held at Duquesne University in Pittsburgh from 30 July to 4 August 1990. Over 400 people registered, of which about 80% opted for the technical sessions, and 20% choosing the general/educational sessions. (A significant swing of interest had occurred since the first conference, when the split was about 50/50). The theme of the conference was 'The age of the Earth.' Most of the presentations were by creationists who consider that the age of the Earth is to be measured in thousands, rather than millions, of years, although several significant inputs were made by creationists who accept conventional geologic timescales.

Conference sessions in the technical stream ranged over a great variety of issues. Geological papers were concerned with the Flood Geology framework of Earth history: the interpretation of field evidences, case studies of specific areas, geologic processes relevant to catastrophism, patterns in the fossil record, biogeography, the Ice Age, and dating techniques. Geophysical topics included a physical mechanism for the rapid reversal of the Earth's magnetic field and a model for rapid continental displacements. Astronomical themes considered comets, the Earth-Moon system, and measurements of the speed of light using one of Jupiter's moons. Two valuable biological papers were included in the proceedings, both of which considered methodologies for studying the created 'kinds.' Considerable controversy was generated by two of the presentations: a team of investigators of the Paluxy River tracks favoured the idea that man-tracks are present and are evidence for humans coexisting with dinosaurs; and a review of recent interest in the fossils of Archaeopteryx concluded that the allegations of fraud are justified. At very least, the questioning responses to these two contributions to the conference showed that the audiences were not adopting a standard party line but were actually using their minds to assess information presented to them.

The conference programme was managed by a Technical Review Committee, who subjected all submitted abstracts to a process of peer review. Later, when the full texts were received, written responses were sought from appropriate experts, including some from the non-creationist academic community. These comments were read out after the conference presentations, thereby launching the discussion time. It is intended that the Technical Conference Proceedings will incorporate edited versions of these formal exchanges. These practices are all helping to lift the level of debate within creationist circles and are an indication of progress towards maturity.

The atmosphere in the conference was very positive: delegates had a vision for the future and showed an enthusiastic commitment to spreading the message. Perhaps this is food for thought for British creationists: where are we going? how are we going to achieve our goals? Without a sense of direction, we will not be able to pray for strength and wisdom to achieve anything! May God grant us that strong desire to see Him honoured as our Creator, Provider, Redeemer and Lord.

One further observation deserves mention: young-Earth creationists are working hard to lift the level of debate, and they deserve to be taken seriously by those who differ from them. Much of the literature critical of this position is failing to address the arguments that are coming from this group. Old-Earthers are going to have to work hard to justify their position on two counts: they are losing ground on technical issues, and they are continuing to neglect their foundations by handling Biblical revelation carelessly. The conference organisers ensured that both groups of creationists had opportunities to express their views, and the attitudes of mutual respect were a splendid example of Christians differing gracefully and engaging in dialogue.

The Proceedings of the First and Second International Conferences on Creationism are available from the ICC, P.O. Box 17578, Pittsburgh, PA 15235, USA. Prices from B.C.S., P.O. Box 22, Rugby, Warwicks., CV22 7SX when available.

A Visit to Poland

J. H. John Peet

IN OCTOBER, two of the BCS committee members (Nancy Darrall and John Peet), together with John's wife, Ruth, were able to make a trip to Poland to speak on Creation and Evolution. The visit originated from a Polish contact of John and Ruth's and was in response to a joint invitation by the Christian Students Association (the equivalent of UCCF in Britain) and the local committee of Solidarity.

The area visited was Silesia in the south western region of Poland. This is the commercial and industrial heartland of the nation. Time was spent sharing with Christian friends to gain an increased appreciation of the problems of the people in general and the Christians in particular.

The first few days were spent with the Baptist fellowship in Orzesze, not far from Gliwice. Both John and Nancy spoke at a meeting for young people of the area on the Saturday evening and John preached on the Sunday. It was interesting to find that the Christians there were surprised that any of their fellow Christians should question a belief in Creation and hold to evolutionary ideas. Subsequent events showed that such a situation did exist in Poland too, though it was usually because a scientific study of Creation was neglected.

On Monday and Tuesday, lectures were held at the Silesian Technical University in Gliwice. Nancy spoke on the first evening and John on the second. Attendances here were estimated at 180 and 170 on the two evenings respectively, with 100 of those present on the Tuesday having also attended on the first occasion. The format established during the week was a lecture lasting for about an hour, followed by a question time running for at least two hours.

These meetings were well publicised, using posters, leaflets, local radio and press, not to mention word of mouth. The clear stand for Christ made by many students was impressive. The question sessions were searching, but very useful. An extra session was squeezed in on the Tuesday evening when Nancy spoke at an English Language School on the reason for our visit to Poland.

On Wednesday, the lectures moved to Katowice, where the university specialises in the biological and environmental sciences. Nancy was invited to speak to biology students and staff in the morning and John spoke to a broader based audience in the evening. The question time was tougher here, with more specialists being present, but with fair and useful debate between the parties.

Thursday was the day for Krakow. Seminars had been planned for the morning, but for technical reasons they had to be cancelled. Instead, Nancy and John both spoke to a group of Roman Catholic students at their meeting in the evening. We then adjourned to a student hostel to meet informally with some of the evangelical students.

Besides the main theme of Creation, there were repeated opportunities to speak of the Gospel itself. This was helped by clear testimony from some of the students present. One of the last questions was 'When will you come again?' Positive invitations were given and will be followed up.

Polish Bones

AN OPPORTUNITY has arisen for Sylvia Baker's booklet *Bone of Contention* to be translated into Polish. The cost will be approximately £300. Anyone who would like to make a tangible contribution towards the spread of the Gospel in Eastern Europe, should send a donation to the Rugby P.O. Box address, given on the back cover.

As communism is dismantled, its foundations are being exposed to the view of ordinary people. Thus they are eager to see if what they have been taught about the supposed Godless, self-creating universe, is as reliable as everything else the state used to tell them. At this unique time, the appearance of *Bone of Contention*, in their own language, and with the questions it raises, could have consequences beyond anything we have seen in the West.

Please pray for the endeavour. Having established the necessary contacts, it is intended that other material should be translated in the near future. If donations exceed the initial amount required for *Bone of Contention*, the money will be kept in a fund dedicated to further translation work.

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